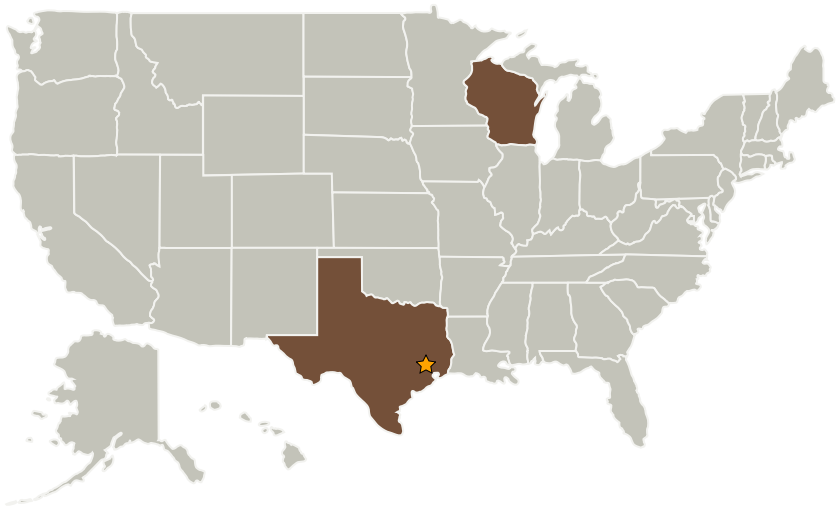
Engineered Multifunction Surfaces for Fluid Handling, Phase II

Completed Technology Project (2005 - 2007)

Project Introduction

ORBITEC will investigate new nanocoating and other engineered surfaces and apply them to passive control of humidity within confined spaces while minimizing power, size and mass requirements. The innovations include: (1) the ability to scale the devices for early Exploration applications including existing environmental control systems, space suits, CEVs, Rovers, Small/Transit/Large Habitats, (2) the use of multiple nanocoatings and capillary channels, and (3) unique Cold Plasma Processes. The primary goals are to further develop capillary channels, hydrophilic and biocidal nanocoatings, and Cold Plasma Nanocoating Process Technology into a new, advanced Condensing Heat Exchanger with no moving parts or particulate coatings. Anticipated results include: (1) requirements and applications for the Exploration Mission, (2) testing of additional substrate materials for plasma deposition of hydrophilic and biocidal nanocoatings applicable to the many controlled environments required for the Exploration Mission, (3) evaluation and testing of new and existing methods for creating capillary channels in various substrate materials, (4) long duration testing and evaluation of nanocoatings on various substrates, (5) design and test of modular, scaleable condensing heat exchangers, and (6) development of a high fidelity Distributed Humidity Control System (DHCS) prototype.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Johnson Space Center (JSC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Johnson Space Center(JSC)	Lead Organization	NASA Center	Houston, Texas
Orbital Technologies Corporation	Supporting Organization	Industry Women-Owned Small Business (WOSB)	Madison, Wisconsin

Primary U.S. Work Locations	
Texas	Wisconsin

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage